Title	**Proposal for a Fermilab-Wide Review/Audit Tracking System (REVTRK)**
Revision History	**Apr 09, 2007 – Original (Mark Kaletka)**
Abstract and Goals	In March 2007, the Laboratory's Quality Assurance Council began a search process to identify a system that could be used Laboratory-wide to organize and track in one place the results of various internal and external reviews, audits and assessments. These results include the findings, observations, best practices and other similar output of the reviewers, as well as the corrective action plans, management plans, milestones, responsibilities, cost and effort estimates the Laboratory provides in response. **We are pleased to propose a solution based on an existing, proven platform that is currently deployed at Fermilab. The proposed solution will extend the ESHTRK system to meet the additional requirements of the QAC and Directorate for a unified Laboratory-wide review tracking system – REVTRK.**

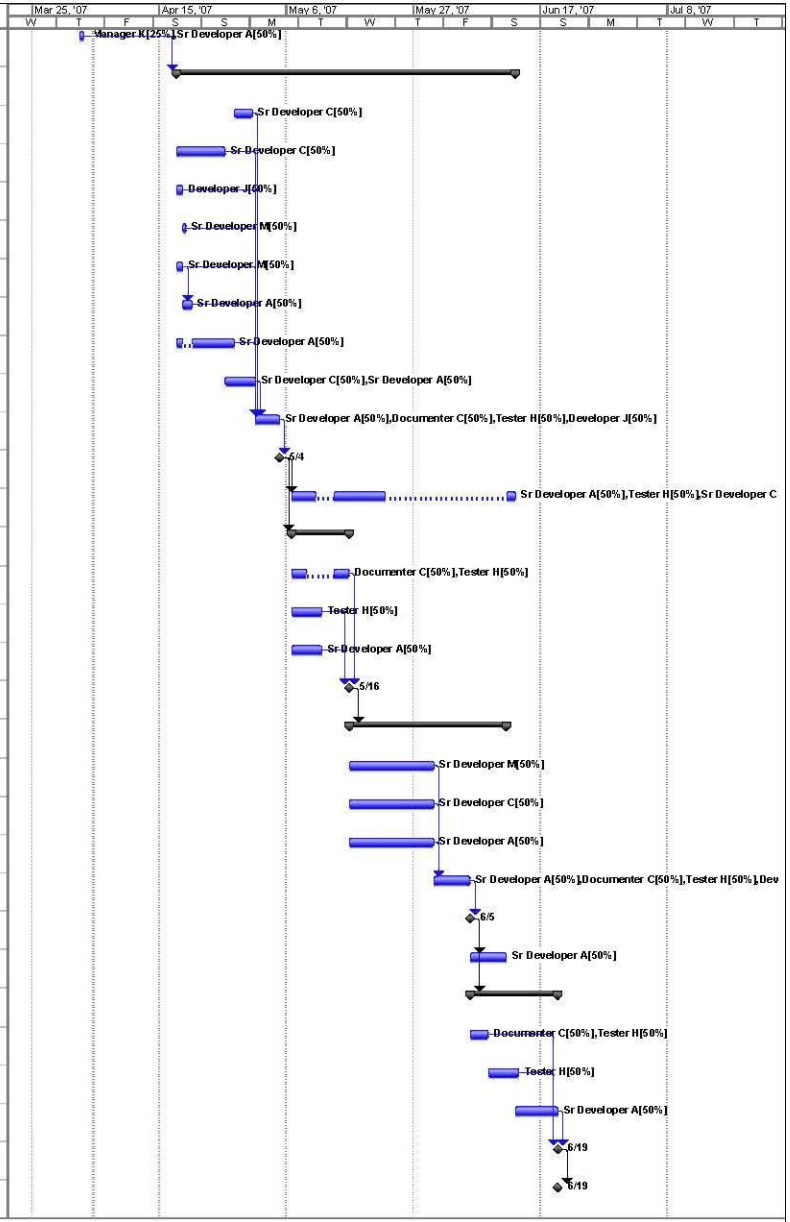
Approach	ESHTRK is an existing and proven system first developed approximately 16 years ago to track reviews, findings and corrective action plans, initially in response to the DOE ES&H Tiger Team. It has since been in constant use across the Laboratory, contains the information for many reviews, and has been continuously improved. ESHTRK is designed and used in a generalized way, adaptable to many different kinds of audits and reviews – not simply ES&H findings – and incorporates long practical experience. It consists of a commercial Oracle database which contains the data – review titles and descriptions, contents of findings, responsibilities and milestones – as well as the metadata describing the structure of the reviews and findings. The latter allow ESHTRK to be easily adapted by modifying appropriate tables to include the new types reviews or findings. A set of web forms provide user-friendly data entry, update and reporting.
	
	REVTRK is proposed as small incremental modifications to ESHTRK to provide the additional functionality specified by the Quality Assurance Council. These modifications are natural extensions of the existing ESHTRK system.
	
	Advantages of this approach include:
	• Low schedule and implementation risk through simple extensions of an existing, proven system by a strong development team already familiar with ESHTRK;
	• No switching costs and a minimal learning curve due to familiarity and comfort with the system by the stakeholder organizations, all of whom are already users of ESHTRK (including the DOE Site Office);
	• Leverage of common tools and best practices already incorporated into ESHTRK:
	  ○ Based on proven commercial Oracle products in widespread use at the Laboratory (including SAP and ERP applications) and overwhelmingly dominant in industry, with considerable expertise available within and outside the Laboratory;
	  ○ Implements the Laboratory's authentication policies through support of certificate-based Kerberos authentication;
	  ○ Integrates with the Laboratory Central Name and Address System (CNAS);
	  ○ Uses the detailed ESHTRK Laboratory organization chart;
	• Continued access to data currently populated in the ESHTRK system without the need for a data migration plan.

Deliverables & Milestones	Apr 18: Project start (contingent on Quality Assurance Council approval of plan) May 4: v1.0 release with all required features; May 16: v1.0 deployment; Jun 5: v1.1 release with additional desired features; Jun 19: v1.1 deployment;
Stakeholder Organizations	Directorate Senior Management & Administrative Staff Quality Assurance Council Division/Section Senior Management & Administrative Staff DOE Site Office Laboratory Reviewees and Reviewers
Participants	Matt Arena, *CD/LSC/DBI (Senior Developer)* Lauri Loebel-Carpenter, *CD/LSC/DBI (Senior Developer)* Marc Mengel, *CD/LSC/DBI (Senior Developer)* Shirley Jones, *CD/LSC/DBI (Developer)* Joy Hathaway, *CD/LSC/DBI (Tester/Documenter)* Forrest Christian, *CD/PSG (Documenter)*

	All the above are available at least at the 50% effort level. Participants from CD/LSC/DBI are members of the ESHTRK support team, are familiar with the design and function of ESHTRK, and technically adept with Oracle and web tools and techniques.
Plan/Summary of Work	The Quality Assurance Council has provided a list of requirements and desirables for the review tracking system, detailed in the attached document "Assurance Council Project System Considerations." ***ESHTRK meets the majority of these requirements in its current production release. The proposed plan only requires adding the missing features.*** The work is divided into four major phases: • Phase 1: Develop a v1.0 release of REVTRK, which **includes all of the required features** from the Quality Assurance Council document: o Several features related to document linking, upload and searching, which require enabling the appropriate features in Oracle and modification of the ESHTRK forms; o Enabling of Oracle journaling to capture the history of all changes to the data – corrective action plans, milestones, responsible parties, etc. – and develop the related reports and alerts; o In addition to tracking the responsible person(s) for each corrective action plan, add tracking of the responsible person(s) for each milestone within each corrective action plan; o Develop a report to track corrective action plan progress against the expected and actual milestone completion dates; o Abstract the ESHTRK concept of "risk" to allow prioritizing findings based on their level of "seriousness" (e.g., "finding" vs. "observation" vs. "best practice). • Phase 2: Review and extend the existing ESHTRK documentation to include the new features of REVTRK and develop (as necessary) training to introduce REVTRK to its intended users. **Deploy REVTRK v1.0 into production**. Obtain stakeholder feedback preparatory to the next phase. • Phase 3: Develop a v1.1 release of REVTRK which **includes the desirable features from the QAC document** as well as, potentially, features identified from stakeholder feedback obtained from the v1.0 production deployment: o XML interchange for import/export with other applications, including the XML document model and the actual code and form modifications for import/export; o A "web portal" view for home pages for a review, allowing easily configured and tailored web pages linked to all the important information of the review – the review documents, findings, status of corrective action plans and milestones, etc; o Further abstraction of the language and concepts within ESHTRK to better tailor REVTRK to the natural language of other kinds of (non-ES&H) reviews; • Phase 4: Review and update the REVTRK documentation and training to include these new features. **Deploy REVTRK v1.1 into production**. Obtain stakeholder feedback. • Transition to ongoing production maintenance.

Effort	**Effort (FTE weeks):** *Phase 0* - Plan & Gap Analysis 0.1 *Phase 1* - v1.0 Required Functionality 4.8 *Phase 2* - System Deployment v1.0 1.5 *Phase 3* - v1.1 Desired Functionality 5.0 *Phase 4* - System Deployment v1.1 1.4 ***Total*** **–** 13 FTE weeks
Costs	**Incremental M&S costs:** Hardware: $0 Software: $0 Licenses: $0 (All incremental costs are $0 since existing ESHTRK hardware, software and Oracle licenses will be used.) Ongoing effort for support and maintenance for the final production REVTRK application, incremental over ESHTRK, should be 0.1 FTE or less, assuming levels of requests similar to ESHTRK. Development effort to implement further major new functionality (requiring effort significantly greater than the nominal support effort) would need to be evaluated separately.
Configuration Management & Change Control	REVTRK will be developed and deployed on the existing ESHTRK infrastructure, which includes development, integration and production instances of hardware and software (application and database). Integration closely matches the production environment and is used for final testing of application changes and the cutting scripts for installing into production. Rapid prototyping development methods will be used which provide for frequent incremental test releases. All code is maintained in the CD CVS repository, which provides full versioning, tracking and auditing of changes. The repository is backed up nightly. Requests for changes (bug fixes, new features) in the production release are requested, prioritized and tracked through CD Help Desk tickets.
Risks & Mitigations	Risks: All risks are schedule risks, not functionality. There is *no* risk which leads to failure to deliver a usable system. ESHTRK as an existing system already meets the majority of the requirements, and is immediately usable for many stakeholders, who are already familiar with the system. The primary risk is a mismatch between available and required effort, due to: • Misunderstanding a requirement resulting in an incorrect estimate of the effort needed to complete it; • "Scope creep" resulting from additional requirements not in the initial estimate; • Diversion of effort to deal with an unforeseen (security) crisis; Risks are mitigated by: • Starting from a stable and usable production system with a history of success; • Stakeholder familiarity and comfort with the existing system; • Good management of requirements and resources; • Ability to shift tasks and resources within CD/LSC/DBI; • Ability to call on a depth of experience in CD/LSC/DBI;
Attachments	*REVTRK Project Gantt Chart* *ESHTRK Usage Statistics* *Assurance Council Project System Considerations Spreadsheet*

ID	Task Name	Duration	Start	Finish	Predecessors
1	Phase 0 - Plan & Gap Analysis	6 hrs	Mon 4/2/07	Mon 4/2/07	
2	**Phase 1 - v1 Required Functionality**	**40 days**	**Wed 4/18/07**	**Tue 6/12/07**	1
3	Add prioritization of findings based on "seriousness"	8 hrs	Fri 4/27/07	Mon 4/30/07	
4	Add tracking of CAP progress against milestone completion dates	48 hrs	Wed 4/18/07	Wed 4/25/07	
5	Add identification of responsible person for ea. milestone w/in a CAP	8 hrs	Wed 4/18/07	Wed 4/18/07	
6	Add "alert" emails to appropriate persons on entry or changes of reviews, findings, CAPs	4 hrs	Thu 4/19/07	Thu 4/19/07	
7	Add insertion of documents	8 hrs	Wed 4/18/07	Wed 4/18/07	
8	Add text search capability	12 hrs	Thu 4/19/07	Fri 4/20/07	7
9	Add linking to existing doc mgmt & proj mgmt systems	48 hrs	Wed 4/18/07	Fri 4/27/07	
10	Provide history of all changes to reviews, actions, plans, findings	24 hrs	Thu 4/26/07	Mon 4/30/07	
11	Integration testing	32 hrs	Tue 5/1/07	Fri 5/4/07	8,3,4,5,6,7,9,10
12	Deliver initial production version	0 days	Fri 5/4/07	Fri 5/4/07	11
13	Review v1 implementation against requirements & obtain stakeholder feedback	96 hrs	Mon 5/7/07	Tue 6/12/07	12
14	**Phase 2 - System Deployment v1**	**7.5 days**	**Mon 5/7/07**	**Wed 5/16/07**	12
15	Develop additional documentation	1 wk	Mon 5/7/07	Wed 5/16/07	
16	Develop training program	1 wk	Mon 5/7/07	Fri 5/11/07	
17	Obtain stakeholder feedback	1 wk	Mon 5/7/07	Fri 5/11/07	
18	Deliver Lab-wide deployment of v1	0 days	Wed 5/16/07	Wed 5/16/07	15,16,17
19	**Phase 3 - v2 Desired Functionality**	**18 days**	**Wed 5/16/07**	**Mon 6/11/07**	18
20	Provide XML interchange formats	2 wks	Wed 5/16/07	Wed 5/30/07	
21	Provide web page "portal" view	2 wks	Wed 5/16/07	Wed 5/30/07	
22	Provide abstractions to language & views relevant to individual or types of reviews	2 wks	Wed 5/16/07	Wed 5/30/07	
23	Integration testing	32 hrs	Wed 5/30/07	Tue 6/5/07	22,20,21
24	Deliver second production version	0 days	Tue 6/5/07	Tue 6/5/07	23
25	Review v2 implementation against requirements & obtain stakeholder feedback	32 hrs	Tue 6/5/07	Mon 6/11/07	24
26	**Phase 4 - System Deployment v2**	**10.5 days**	**Tue 6/5/07**	**Tue 6/19/07**	24
27	Modify documentation	3 days	Tue 6/5/07	Fri 6/8/07	
28	Modify training program	3 days	Fri 6/8/07	Wed 6/13/07	
29	Obtain stakeholder feedback	1 wk	Wed 6/13/07	Tue 6/19/07	
30	Deliver Lab-wide deployment of v2	0 days	Tue 6/19/07	Tue 6/19/07	27,28,29
31	Phase 5 - On-Going Maintenance & Improvement	0 days	Tue 6/19/07	Tue 6/19/07	30



Project: Audit Track
Date: Wed 4/4/07

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

ESHTRK Usage

8466 Reviews
47340 Findings
53784 Finding Responsibilities
46185 Corrective Action Plans
2306 Milestones

Number of reviews owned by a division/section:

AD	596
BS	151
CD	496
DI	39
ES	911
FE	258
PD	1613
RD	2436
TD	1775
WR	191

Number of findings in a division/section:

AD	9761
BS	857
CD	3568
DI	360
ES	1007
FE	2703
FI	5
PD	2729
RD	16305
TD	8629
WR	1304

Number of finding responsibilities in a division/section:

AD	9713
BS	952
CD	3567
DI	2968
ES	3849
FE	2206
FI	14
PD	2691
RD	16266
TD	10237
WR	1264

Audit Types

176	GENERAL REVIEW/AUDIT
26	SAFETY
4	FIRE PROTECTION MAINTENANCE
2	WORK CONTROL DOCUMENTS
1	WASTEWATER DISCHARGES
1	CONTROL OF CHEMICALS
30	OUTSIDE AGENCY REVIEW
7	INDUSTRIAL HYGIENE
73	CONSTRUCTION SAFETY
5	QUALITY ASSURANCE
39	INTERNAL DIV/SEC AUDIT
9	DIRECTORATE AUDIT
5	OCCUPATIONAL
4	OSHA-TYPE INSPECTION
11	ELECTRICAL SAFETY
16	INDUSTRIAL SAFETY
26	FIRE PROTECTION & LIFE SAFETY CODE
14	OCCUPATIONAL RADIATION PROTECTION
180	ES&H AUDIT
1	MATERIAL CONTROL & ACCOUNTABILITY
1	TIGER TEAM APPRAISALS
5	TRIENNIAL SAP REVIEW
16	OCCURRENCE REPORTING
2	SPECIFIC ES&H
13	ENVIRONMENTAL
1	SAFETY ANALYSIS & REVIEW SYSTEM
1	PACKAGING & TRANSPORTATION
1	OCCUPATIONAL MEDICINE APPRAISALS
1	QUALITY ASSURANCE
14	RADIOACTIVE WASTE GENERATOR REVIEW
8	NEPA
2	SPECIFIC ES&H TOPIC
4	MULTIPLE DISCIPLINARY APPRAISAL (ES&H)
1	FACTORY MUTUAL APPRAISALS
269	TRIPARTITE SELF ASSESSMENT
2	CHEMICAL WASTE & WASTE MINIMAZATION
2	INDUSTRIAL SAFETY & FIRE PROTECTION
1	HEALTH
4	ASSESSMENT
1	ENVIRONMENTAL PERMITS
11	EMERGENCY PREPAREDNESS
5637	DEPT/GROUP WALKTHROUGH
15	RESEARCH DIVISION QA/SAP
37	WASTE MANAGEMENT
8	GENERAL REVIEW
1184	DIV/SEC AUDIT/REVIEW
1	MANAGEMENT